

CHAPTER 2

DESCRIPTION OF THE WATAUGA RIVER WATERSHED

- 2.1. Background
- 2.2. Description of the Watershed
 - 2.2.A. General Location
 - 2.2.B. Population Density Centers
- 2.3. General Hydrologic Description
 - 2.3.A. Hydrology
 - 2.3.B. Dams
- 2.4. Land Use
- 2.5. Ecoregions and Reference Streams
- 2.6. Natural Resources
 - 2.6.A. Designated State Natural Areas
 - 2.6.B. National Forest
 - 2.6.C. Rare Plants and Animals
 - 2.6.D. Wetlands
- 2.7. Cultural Resources
 - 2.7.A. Nationwide Rivers Inventory
 - 2.7.B. Interpretive Areas
 - 2.7.C. Wildlife Management Area

2.1 BACKGROUND. The name “Watauga” means “beautiful river” in the Cherokee language. Cattle and tobacco farming, timber logging operations, and urban areas all occur within the watershed. Part of the Cherokee National Forest, several state parks and wildlife management areas and TVA lakes provide the backdrop for recreation in the watershed.

The Watauga River Watershed includes cool, clear streams with high gradient and rugged terrain. It contains one of the richest centers of biodiversity in the eastern U.S. Springs and caves are relatively numerous in the Southern Limestone/Dolomite Valleys and Low Rolling Hills. The watershed has great aquatic habitat diversity and supports a diverse fish fauna.

This Chapter describes the location and characteristics of the Watauga River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Tennessee portion of Watauga River Watershed is located in East Tennessee and includes parts of Carter, Johnson, Sullivan, Unicoi, and Washington Counties.



Figure 2-1. General Location of the Watauga River Watershed.

| COUNTY | % OF WATERSHED IN EACH COUNTY |
|------------|-------------------------------|
| Carter | 54.3 |
| Johnson | 25.7 |
| Washington | 14.2 |
| Sullivan | 2.9 |
| Unicoi | 2.9 |

Table 2-1. The Watauga River Watershed Includes Parts of Five East Tennessee Counties.

2.2.B. Population Density Centers. Six state highways serve the major communities in the Watauga River Watershed.

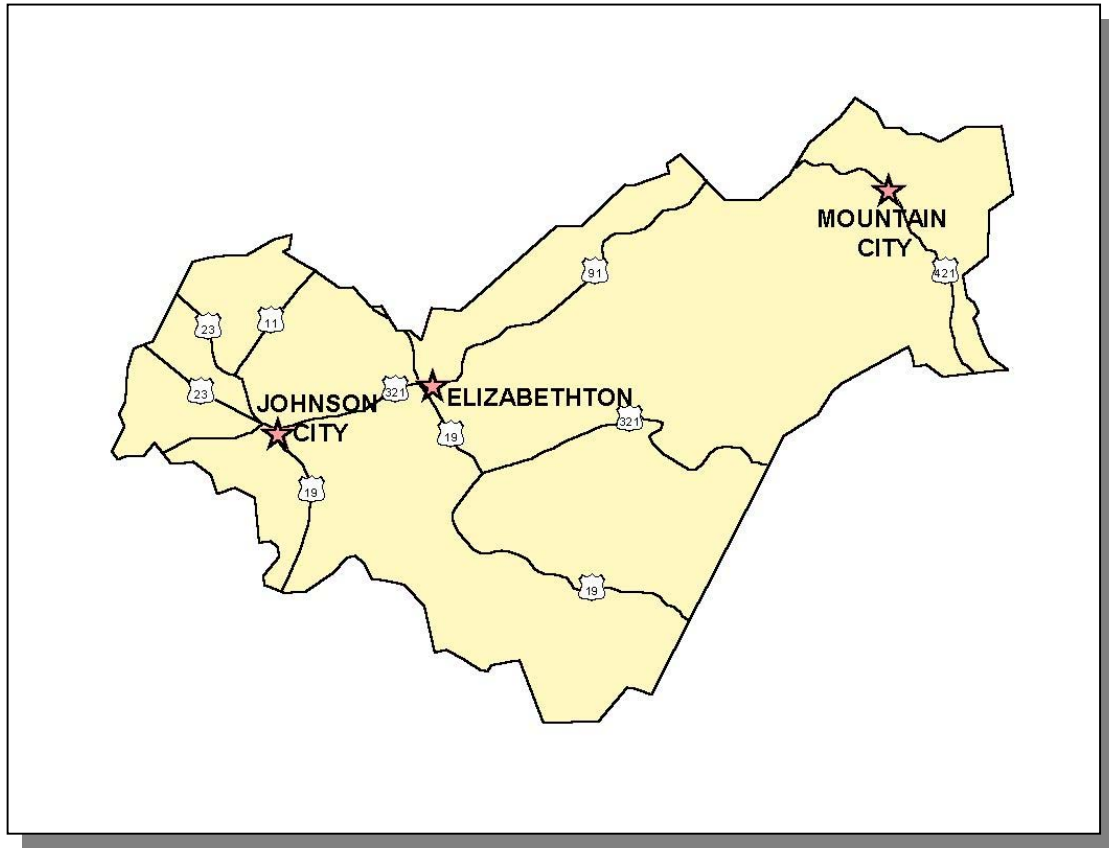


Figure 2-2. Municipalities and Roads in the Watauga River Watershed.

| MUNICIPALITY | POPULATION | COUNTY |
|----------------|------------|------------|
| Johnson City | 49,381 | Washington |
| Elizabethton* | 11,931 | Carter |
| Mountain City* | 2,169 | Johnson |
| Watauga | 389 | Carter |

Table 2-2. Municipalities in the Watauga River Watershed. Population based on 1990 census (Tennessee Blue Book). Asterisk (*) indicates county seat.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Watauga River Watershed, designated the Hydrologic Unit Code (HUC) 06010103 by the USGS, drains approximately 614 square miles in Tennessee and drains to Boone Reservoir. The entire watershed drains approximately 816 square miles.

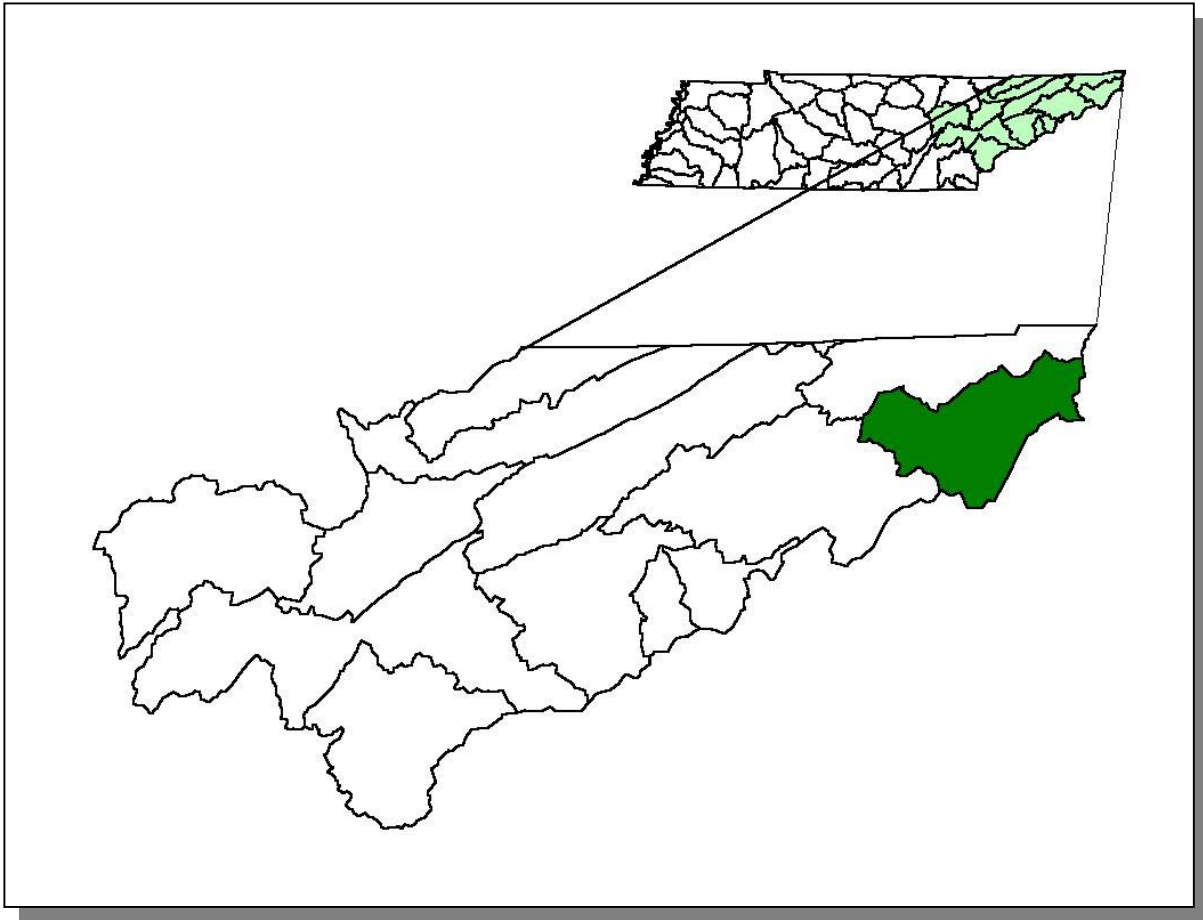


Figure 2-3. The Watauga River Watershed is Part of the Upper Tennessee River Basin.

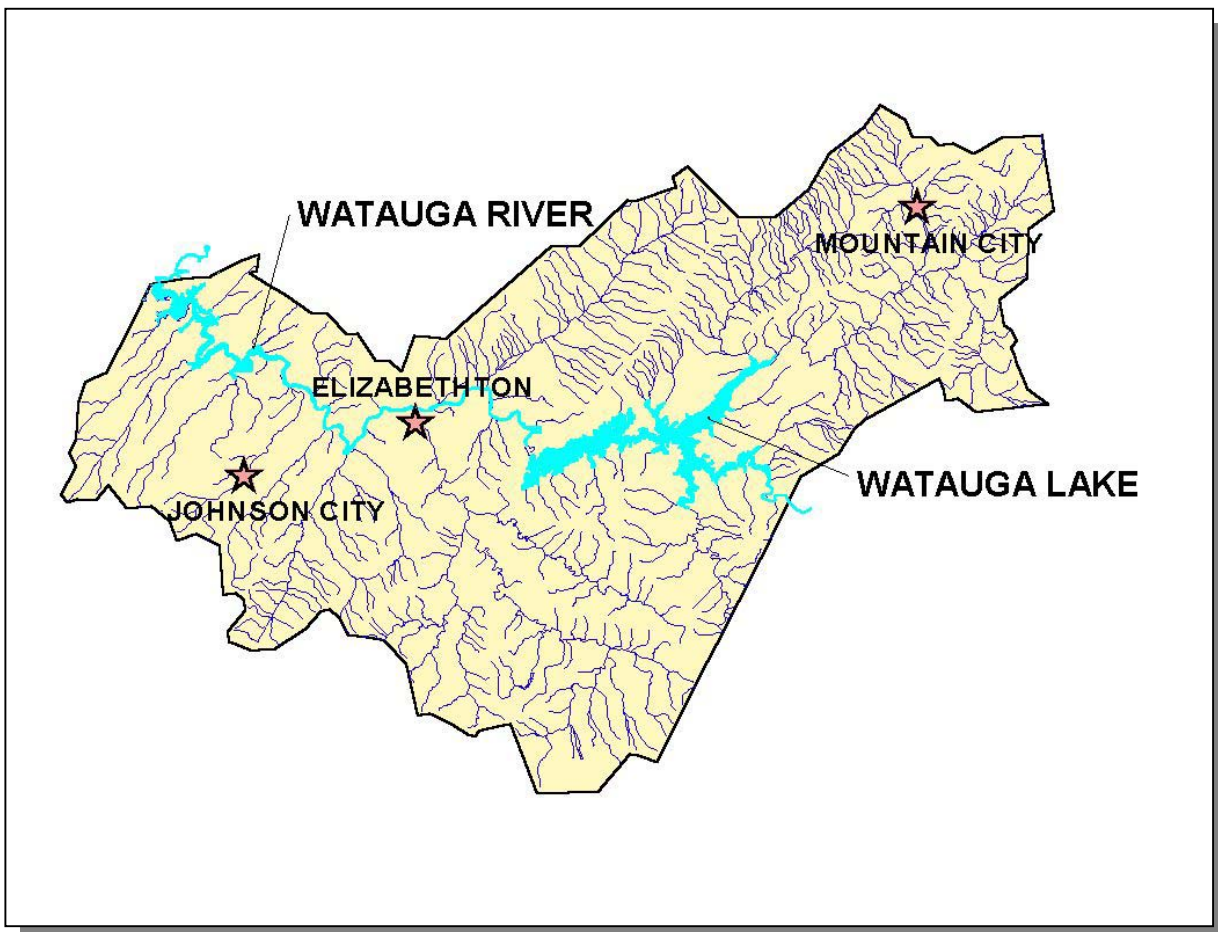


Figure 2-4. Hydrology in the Watauga River Watershed. There are 1,039 stream miles and 6,499 lake acres recorded in River Reach File 3 in the Tennessee portion of the Watauga River Watershed. There are 1553 stream miles in the entire watershed. Locations of Elizabethton, Johnson City, and Mountain City are shown for reference.

2.3.B. Dams. There are 6 dams inventoried by TDEC Division of Water Supply in the Watauga River Watershed. These dams either retain at least 30 acre-feet of water or have structures at least 20 feet high. Additional dams may be found in the watershed.

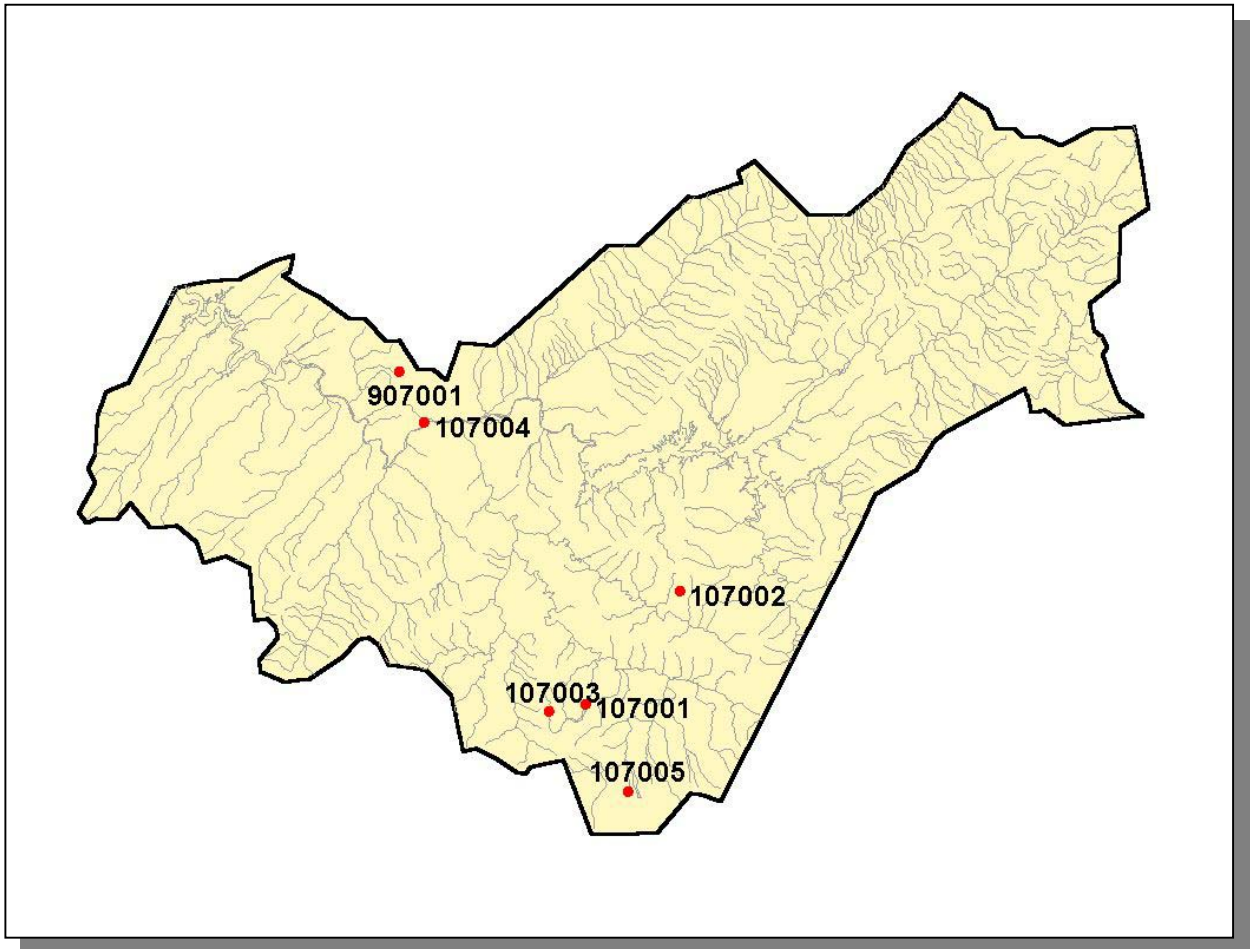


Figure 2-5. Location of Inventoried Dams in the Watauga River Watershed. More information is provided in Watauga-Appendix II.

2.4 LAND USE. Land Use Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

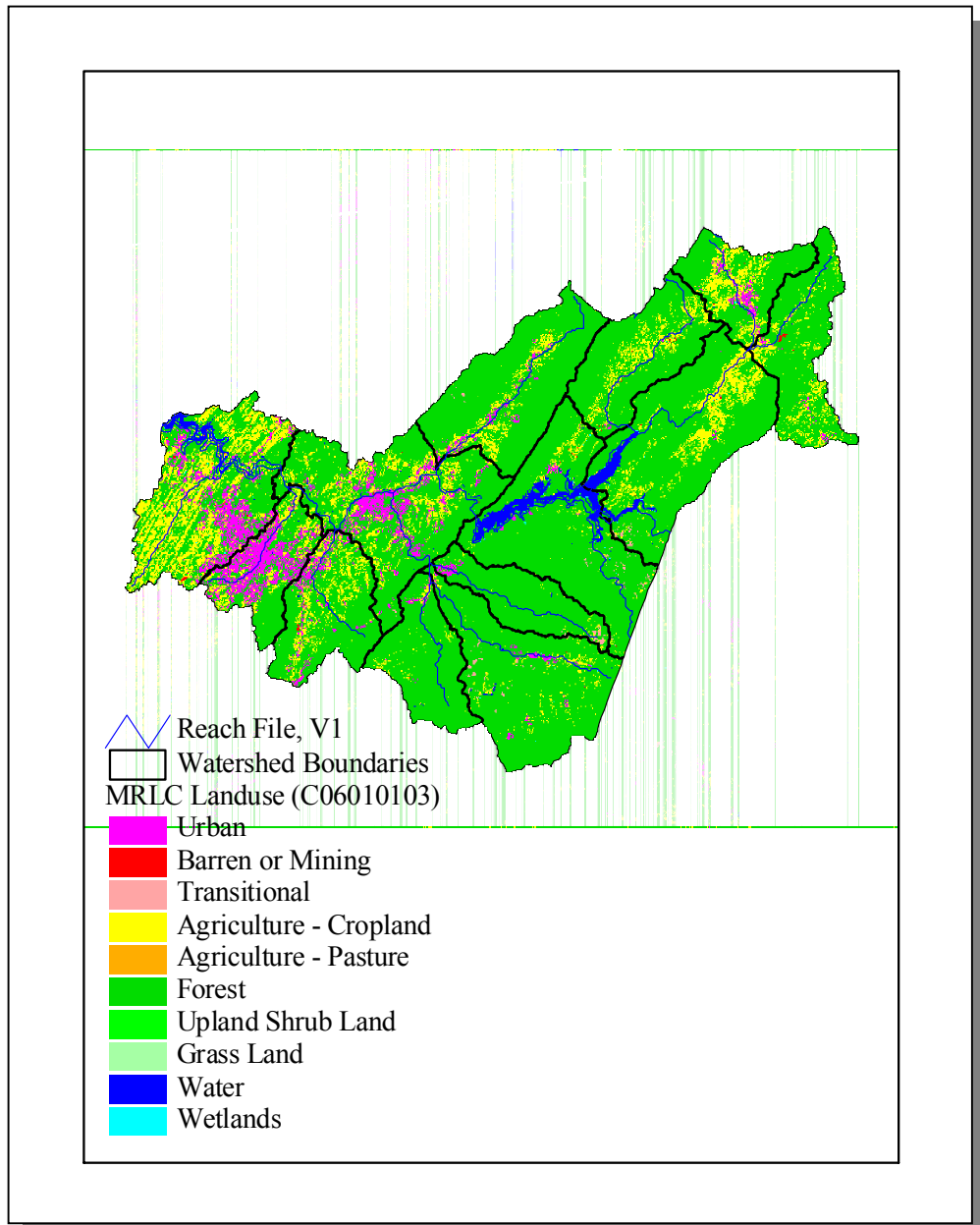


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

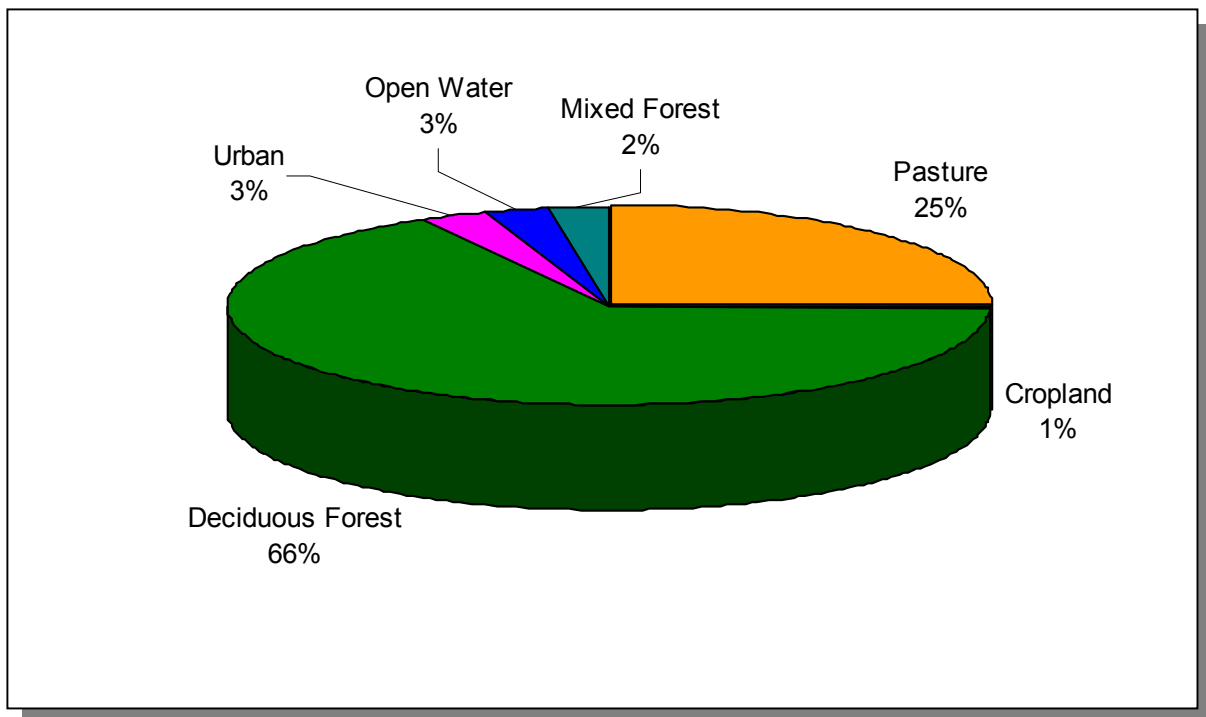


Figure 2-7. Land Use Distribution in the Watauga River Watershed. More information is provided in Watauga-Appendix II.

2.5 ECOREGIONS AND REFERENCE STREAMS. Ecoregions are defined as relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies include the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Watauga River Watershed lies within 2 Level III ecoregions (Blue Ridge Mountains and Ridge and Valley) and contains 5 Level IV subecoregions (Griffen, Omernik, Azavedo, 1997):

- Southern Igneous Ridges and Mountains (66d) occur in Tennessee's northeastern Blue Ridge near the North Carolina border, primarily on Precambrian-age igneous and high-grade metamorphic rocks. The typical crystalline rock types include granite, gneiss, schist, and metavolcanics, covered by well-drained, acidic brown loamy soils. Elevations of this rough, dissected region range from 2000-6200 feet, with Roan Mountain reaching 6286 feet. Although there are a few small areas of pasture and apple orchards, the region is mostly forested; Appalachian oak and northern hardwood forests predominate.

- Southern Sedimentary Ridges (66e) include some of the westernmost foothill areas of the Blue Ridge Mountains ecoregion, such as the Bean, Starr, Chilhowee, English, Stone, Bald, and Iron Mountain areas. Slopes are steep, and elevations are generally 1000-4500 feet. The rocks are primarily Cambrian-age sedimentary (shale, sandstone, siltstone, quartzite, conglomerate), although some lower stream reaches occur on limestone. Soils are predominantly friable loams and fine sandy loams with variable amounts of sandstone rock fragments, and support mostly mixed oak and oak-pine forests.
- Limestone Valleys and Coves (66f) are small but distinct lowland areas of the Blue Ridge, with elevations mostly between 1500 and 2500 feet. About 450 million years ago, older Blue Ridge rocks to the east were forced up and over younger rocks to the west. In places, the Precambrian rocks have eroded through to Cambrian or Ordovician-age limestones, as seen especially in isolated, deep cove areas that are surrounded by steep mountains. The main areas of limestone include the Mountain City lowland area and Shady Valley in the north; and Wear Cove, Tuckaleechee Cove, and Cades Cove of the Great Smoky Mountains in the south. Hay and pasture, with some tobacco patches on small farms, are typical land uses.
- Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f) form a heterogeneous region composed predominantly of limestone and cherty dolomite. Landforms are mostly low rolling ridges and valleys, and the soils vary in their productivity. Landcover includes intensive agriculture, urban and industrial, or areas of thick forest. White oak forests, bottomland oak forest, and sycamore-ash-elm riparian forest are the common forest types, and grassland barrens intermixed with cedar-pine glades also occur here.
- Southern Shale Valleys (67g) consist of lowlands, rolling valleys, and slopes and hilly areas that are dominated by shale materials. The northern areas are associated with Ordovician-age calcareous shale, and the well-drained soils are often slightly acid to neutral. In the south, the shale valleys are associated with Cambrian-age shales that contain some narrow bands of limestone, but the soils tend to be strongly acid. Small farms and rural residences subdivide the land. The steeper slopes are used for pasture or have reverted to brush and forested land, while small fields of hay, corn, tobacco, and garden crops are grown on the foot slopes and bottom land.

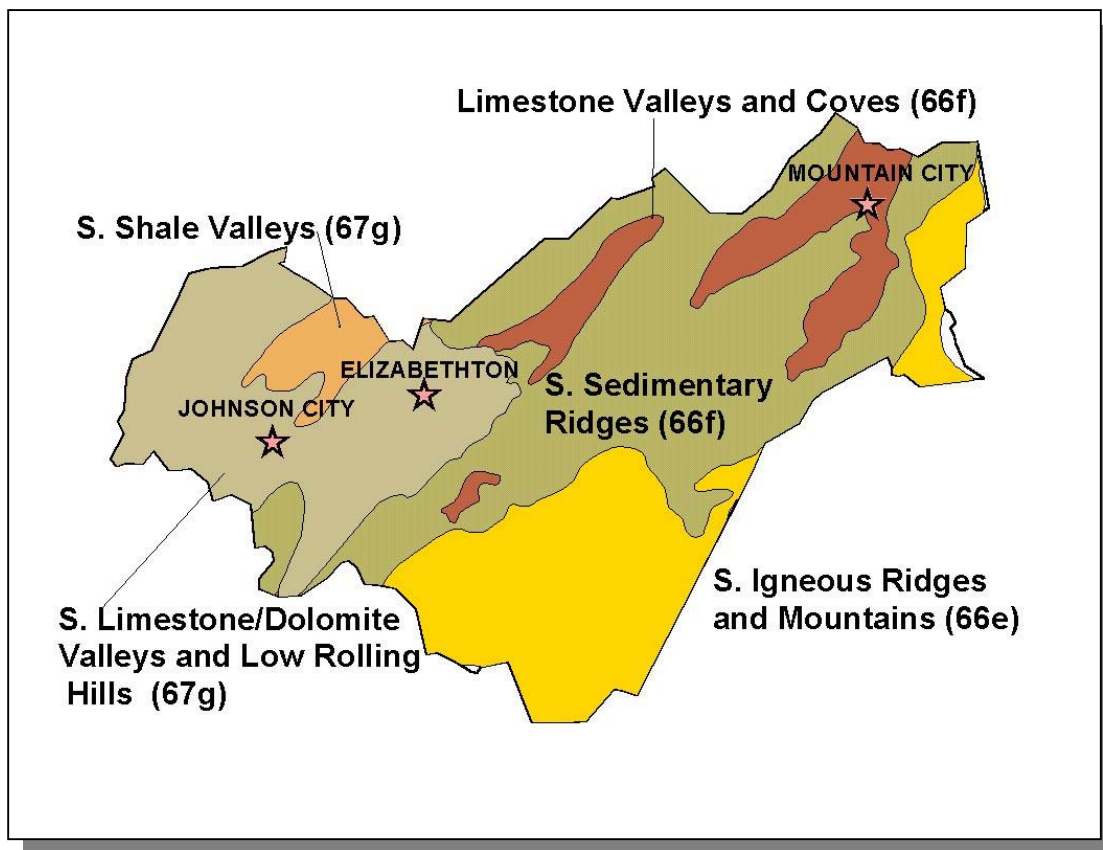


Figure 2-8. Level IV Ecoregions in the Watauga River Watershed. Elizabethton, Johnson City and Mountain City are shown for reference.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

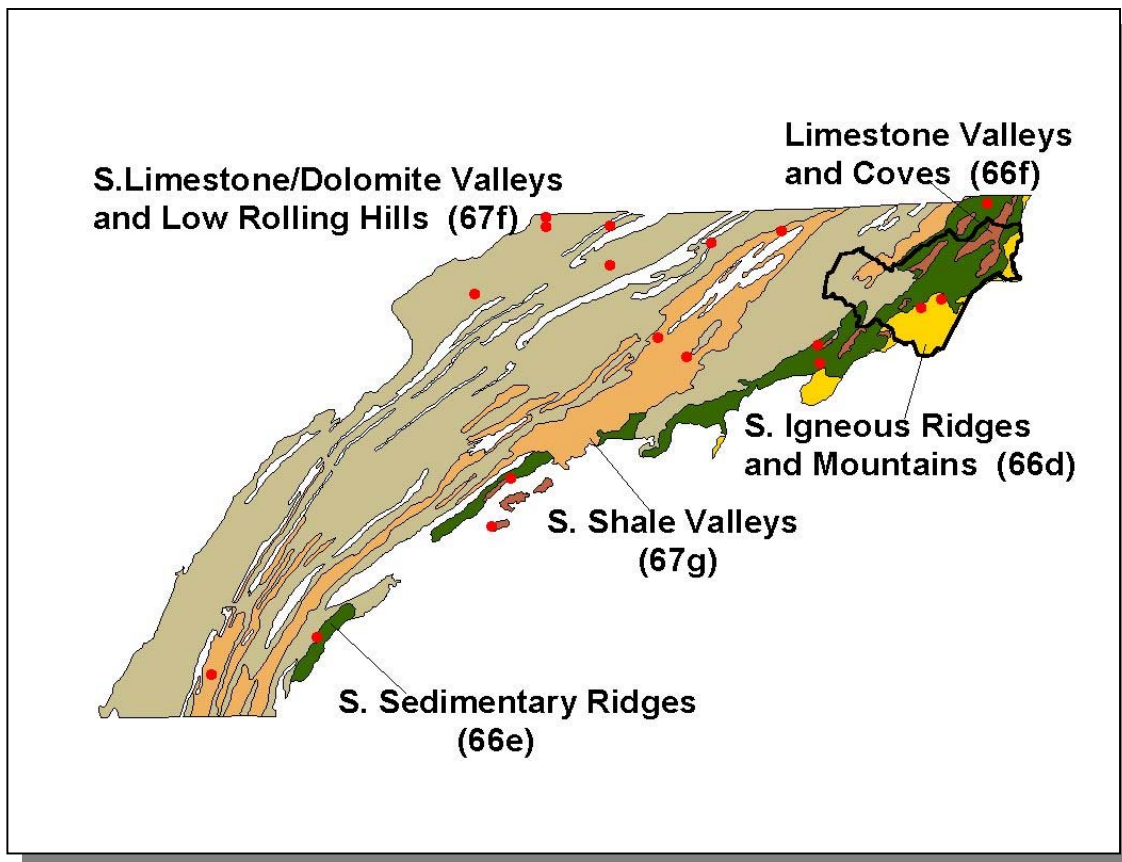


Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 66d, 66e, 66f, 67f, and 67g. The Watauga River Watershed is shown for reference. More information is provided in Watauga-Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Areas. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Watauga River Watershed has two Designated Natural Areas:

Watauga River Bluffs Designated State Natural Area is a 50-acre site located along the Watauga River in Carter County.

Hampton Creek Cove Designated State Natural Area is a 693-acre site that supports several rare plants and animals in the headwaters of Hampton Creek.

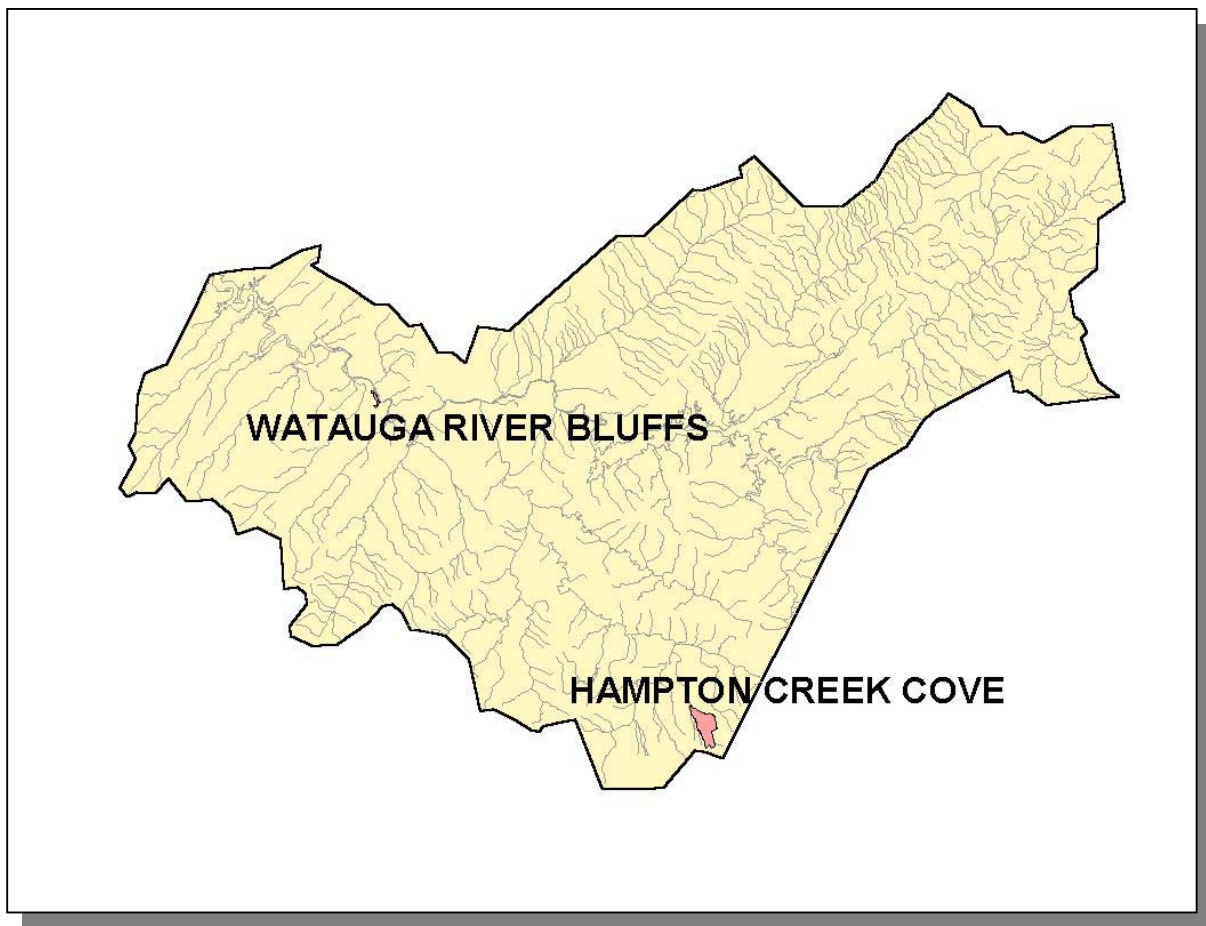


Figure 2-10. There are Two Designated State Natural Areas in the Watauga River Watershed.

2.6.B. National Forest. Covering 630,000 acres (187 square miles in the Tennessee portion of the Watauga River Watershed), the Cherokee National Forest is the largest tract of public land in the state. It is managed for multiple uses by the U.S. Department of Agriculture—Forest Service.

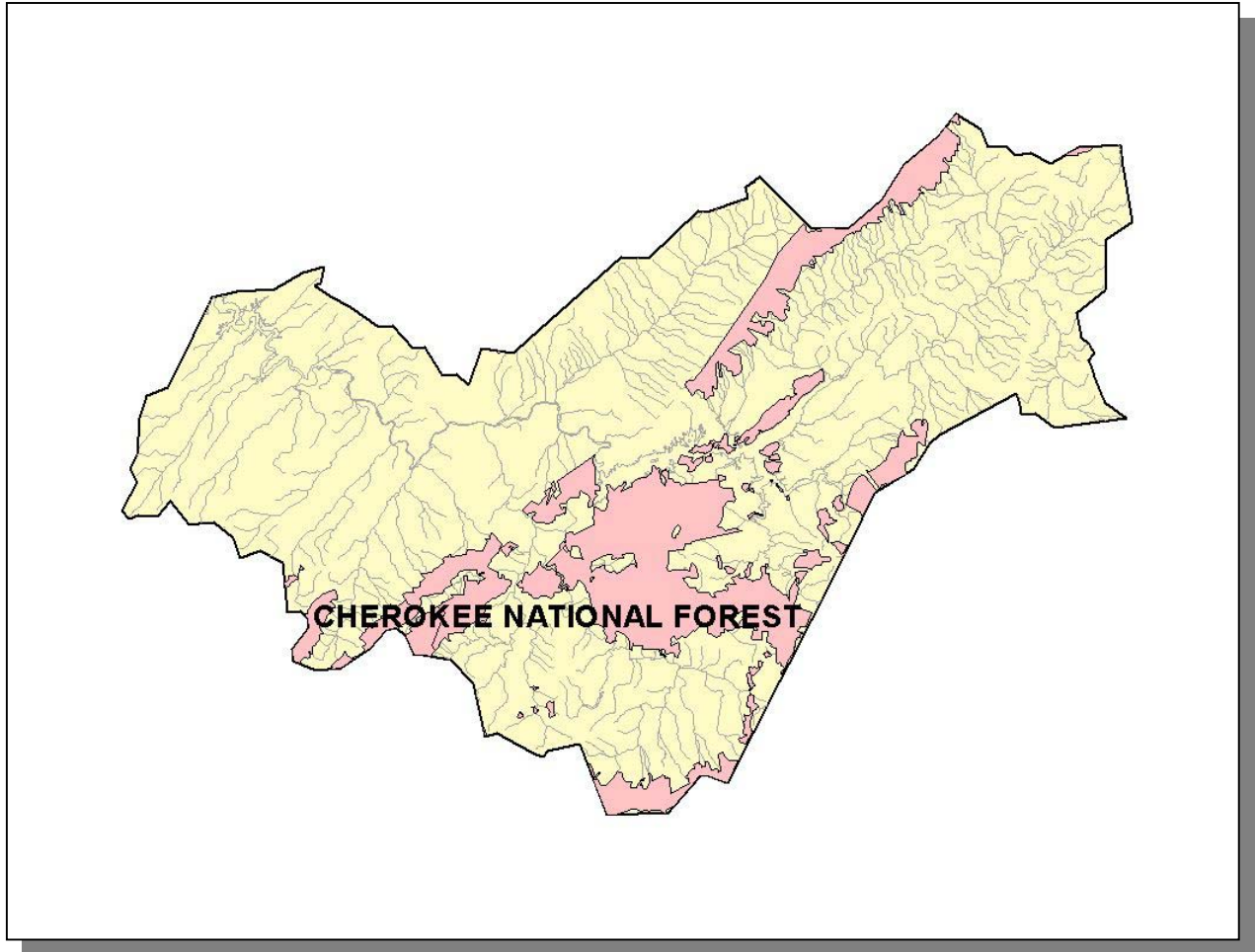


Figure 2-11. Location of Cherokee National Forest in Watauga River Watershed.

2.6.C. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the Federal Endangered Species Act.

| GROUPING | NUMBER OF RARE SPECIES |
|--------------|------------------------|
| Crustaceans | 0 |
| Insects | 4 |
| Mussels | 0 |
| Snails | 0 |
| Amphibians | 3 |
| Birds | 12 |
| Fish | 2 |
| Mammals | 11 |
| Reptiles | 0 |
| Plants | 91 |
| Total | 123 |

Table 2-3. There are 123 Documented Rare Plant and Animal Species in the Watauga River Watershed. Additional rare plant and animal species may be present.

Additionally, in the Watauga River Watershed, there are two rare fish species.

| SCIENTIFIC NAME | COMMON NAME | FEDERAL STATUS | STATE STATUS |
|-----------------------------|------------------|----------------|--------------|
| <i>Percina aurantiaca</i> | Tangerine darter | | D |
| <i>Percina macrocephala</i> | Longhead darter | | T |

Table 2-4. Rare Aquatic Species in the Watauga River Watershed. State Status: T, Listed Threatened by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency.

2.6.D. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at <http://www.state.tn.us/environment/epo/wetlands/strategy.zip>.

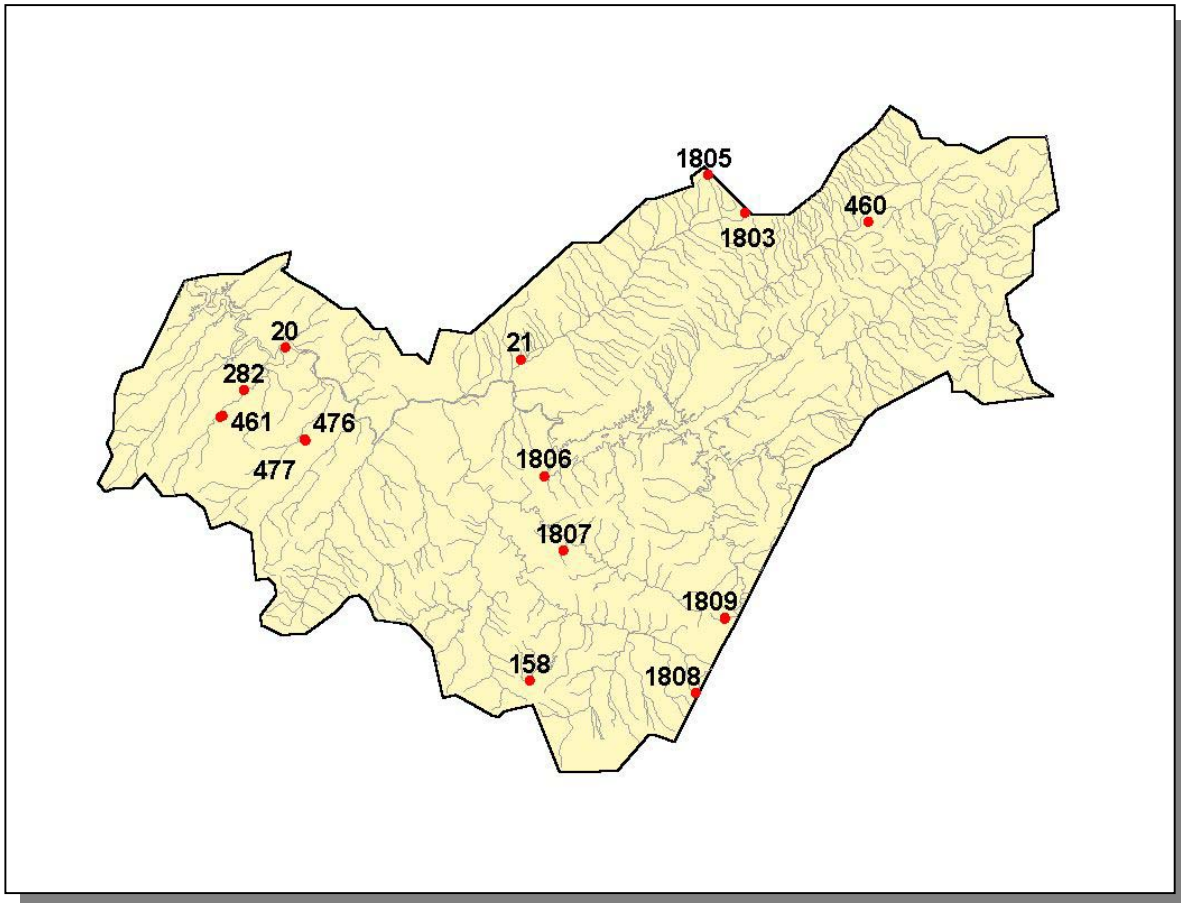


Figure 2-12. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Watauga River Watershed. There may be additional wetland sites in the watershed. More information is provided in Watauga-Appendix II.

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional

significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of three streams in the Watauga River Watershed:

Doe River. One of the most majestic, deep gorge areas in eastern U.S., in a remote area, with 1000 foot walls.

Watauga Creek. Scenic gorge area with several waterfalls and large boulders; recreational opportunities throughout.

Watauga River. Scenic gorge area with several waterfalls and large boulders.

| RIVER | SCENIC | RECREATION | GEOLOGIC | FISH | WILDLIFE | HISTORIC | CULTURAL |
|---------------|--------|------------|----------|------|----------|----------|----------|
| Doe River | X | | | | | | |
| Watauga Creek | X | X | X | X | X | X | X |
| Watauga River | X | | | | | | |

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/tn.htm>

2.7.B. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- Sycamore Shoals State Historic Area, the site of a frontier settlement, the reconstruction of Fort Watauga, and a hiking/fitness trail
- Tipton-Haynes Historic Site, location of the Battle of the Lost State of Franklin and a museum

In addition, many local interpretive areas are common, most notably the Doe River Covered Bridge, a white clapboard bridge built in 1882 across the Doe River.

2.7.C. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages the Doe Mountain Wildlife Management Area near Mountain City, Tennessee.

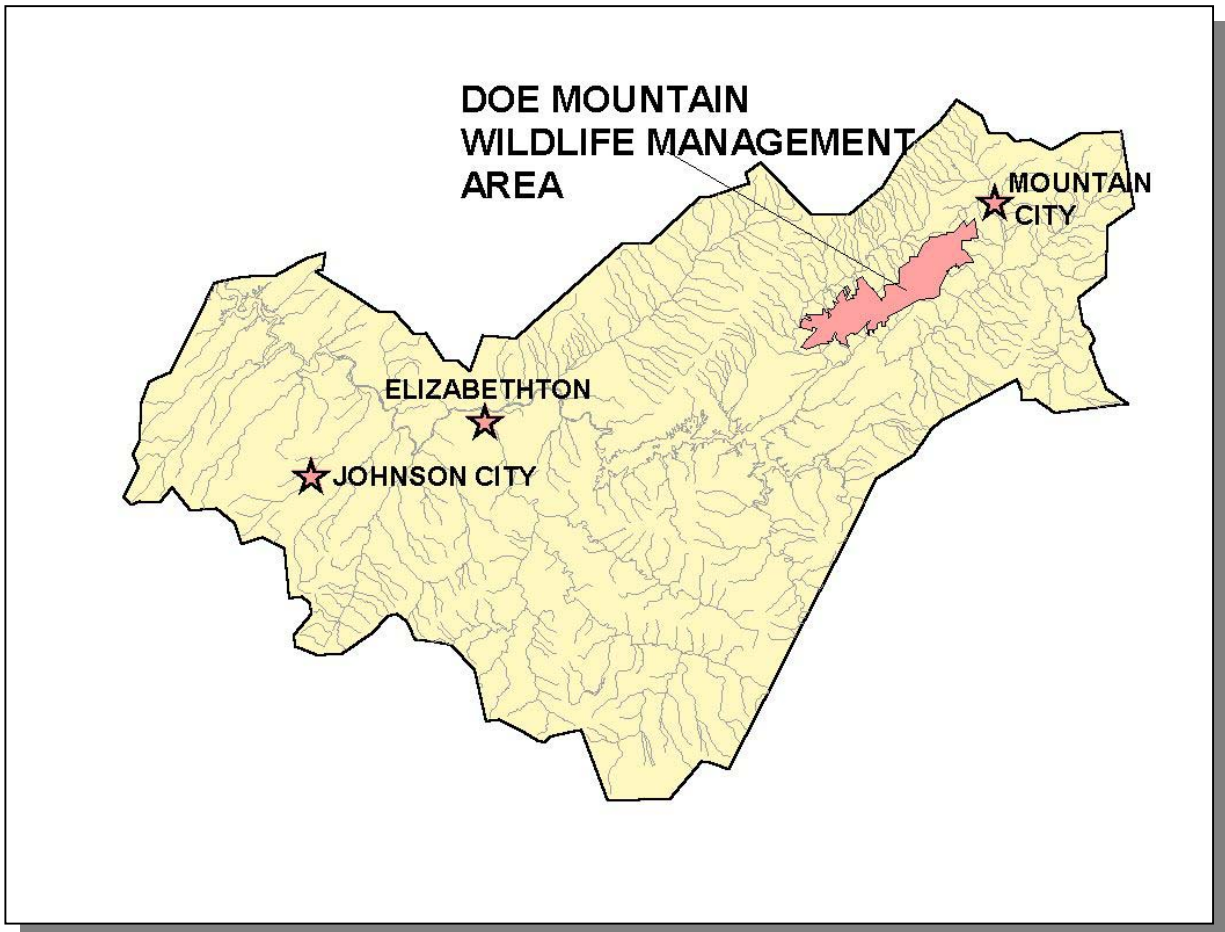


Figure 2-13. TWRA Manages the Doe Mountain Wildlife Management Area in the Watauga River Watershed.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/riv>

| STREAM | NSQ | RB | RF | STREAM | NSQ | RB | RF |
|---------------|-------|----|----|---------------------|-----|-----|----|
| Boones Creek | 3 | | | Laurel Fork Creek | 1 | | 1 |
| Buffalo Creek | 3 | | | Reedy Creek | 3 | | |
| Cobb Creek | 3 | | | Roan Creek | 3 | | 1 |
| Doe Creek | 2 | | 1 | Roaring Creek | 2 | | |
| Doe River | 1,2,3 | 1 | | Roaring Forge Creek | 3 | | |
| Dry Creek | 2 | | | Shell Creek | 2 | | |
| Elk River | 2 | | 1 | Sinking Creek | 3 | | |
| Furnace Creek | 2 | | | South Brush Creek | 4 | | |
| Gap Creek | 2 | | | Stony Creek | 3 | | |
| Goose Creek | 2,3 | | | Tiger Creek | 2 | | |
| Knob Creek | 4 | | | Watauga River | 1,3 | 1,2 | 1 |

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed as a fishery